

Please amend the above-identified patent application, without prejudice, as follows:  
IN THE SPECIFICATION:

IN THE CLAIMS:

Amend claims 6 and 12 as follows:

6. (amended) A method for the preparation of mono- or bisacylphosphines, mono- or bisacylphosphine oxides or mono- or bisacylphosphine sulfides comprising reacting a compound of formula I according to claim 1.

12. (amended) A photocurable composition comprising

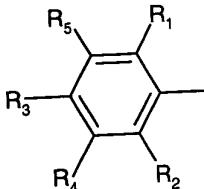
(a) at least one ethylenically unsaturated photopolymerizable compound and

(b) at least one compound of the formula II according to claim 2 or at least one compound

according to formula III 
$$\text{Ar}-\overset{\text{O}}{\underset{\text{R}_6}{\text{C}}}=\overset{\text{(A)}_x}{\text{P}}-\text{Z}_1 \quad (\text{III}), \text{ in which}$$

A is O or S;

x is 0 or 1;

Ar is a group ; or Ar is cyclopentyl, cyclohexyl, naphthyl, anthracyl,

biphenyl or an O-, S- or N-containing 5- or 6-membered heterocyclic ring, where the radicals cyclopentyl, cyclohexyl, naphthyl, anthracyl, biphenyl and 5- or 6-membered heterocyclic ring are unsubstituted or substituted by halogen, C<sub>1</sub>-C<sub>4</sub>alkyl and/or C<sub>1</sub>-C<sub>4</sub>alkoxy;

R<sub>1</sub> and R<sub>2</sub> independently of one another are C<sub>1</sub>-C<sub>20</sub>alkyl, OR<sub>11</sub>, CF<sub>3</sub> or halogen;

R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> independently of one another are hydrogen, C<sub>1</sub>-C<sub>20</sub>alkyl, OR<sub>11</sub> or halogen;

or in each case two of the radicals R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> together form C<sub>1</sub>-C<sub>20</sub>alkylene which can be interrupted by O, S or -NR<sub>14</sub>;

$R_6$  is  $C_1$ - $C_{24}$ alkyl, unsubstituted or substituted by  $C_5$ - $C_{24}$ cycloalkenyl, phenyl, CN,  $C(O)R_{11}$ ,  $C(O)OR_{11}$ ,  $C(O)N(R_{14})_2$ ,  $OC(O)R_{11}$ ,  $OC(O)OR_{11}$ ,  $N(R_{14})C(O)N(R_{14})$ ,  $OC(O)NR_{14}$ ,  $N(R_{14})C(O)OR_{11}$ , cycloalkyl, halogen,  $OR_{11}$ ,  $SR_{11}$ ,  $N(R_{12})(R_{13})$  or  $-\overset{\text{O}}{\underset{\text{H}}{\text{C}}}-\text{CH}_2$ ;

$C_2$ - $C_{24}$ alkyl which is interrupted once or more than once by nonconsecutive O, S or  $NR_{14}$  and which is unsubstituted or substituted by phenyl,  $OR_{11}$ ,  $SR_{11}$ ,  $N(R_{12})(R_{13})$ , CN,  $C(O)R_{11}$ ,  $C(O)OR_{11}$ ,

$C(O)N(R_{14})_2$  and/or  $-\overset{\text{O}}{\underset{\text{H}}{\text{C}}}-\text{CH}_2$ ;

$C_2$ - $C_{24}$ alkenyl which is uninterrupted or interrupted once or more than once by nonconsecutive O, S or  $NR_{14}$  and which is unsubstituted or substituted by  $OR_{11}$ ,  $SR_{11}$  or  $N(R_{12})(R_{13})$ ;

$C_5$ - $C_{24}$ cycloalkenyl which is uninterrupted or interrupted once or more than once by nonconsecutive O, S or  $NR_{14}$  and which is unsubstituted or substituted by  $OR_{11}$ ,  $SR_{11}$  or  $N(R_{12})(R_{13})$ ;

$C_7$ - $C_{24}$ arylalkyl which is unsubstituted or substituted on the aryl group by  $C_1$ - $C_{12}$ alkyl,  $C_1$ - $C_{12}$ alkoxy or halogen;

$C_4$ - $C_{24}$ cycloalkyl which is uninterrupted or interrupted once or more than once by O, S and/or  $NR_{14}$  and which is unsubstituted or substituted by  $OR_{11}$ ,  $SR_{11}$  or  $N(R_{12})(R_{13})$ ; or  $C_8$ - $C_{24}$ arylalkyl or  $C_8$ - $C_{24}$ arylalkenyl;

$R_{11}$  is H,  $C_1$ - $C_{20}$ alkyl,  $C_2$ - $C_{20}$ alkenyl,  $C_3$ - $C_8$ cycloalkyl, phenyl, benzyl or  $C_2$ - $C_{20}$ alkyl which is interrupted once or more than once by nonconsecutive O atoms and which is unsubstituted or substituted by OH and/or SH;

$R_{12}$  and  $R_{13}$  independently of one another are hydrogen,  $C_1$ - $C_{20}$ alkyl,  $C_3$ - $C_8$ cycloalkyl, phenyl, benzyl or  $C_2$ - $C_{20}$ alkyl, which is interrupted once or more than once by O or S and which is unsubstituted or substituted by OH and/or SH; or  $R_{12}$  and  $R_{13}$  together are  $C_3$ - $C_5$ alkylene which is uninterrupted or interrupted by O, S or  $NR_{14}$ ;

$Z_1$  is  $C_1$ - $C_{24}$ alkyl, which is unsubstituted or substituted once or more than once by  $OR_{15}$ ,  $SR_{15}$ ,

$N(R_{16})(R_{17})$ , phenyl, halogen, CN,  $-N=C=A$ ,  $-\overset{\text{O}}{\underset{\text{H}}{\text{C}}}-\text{CH}_2$ ,  $-\overset{\text{A}}{\underset{\text{H}}{\text{C}}}-R_{18}$ ,  $-\overset{\text{A}}{\underset{\text{H}}{\text{C}}}-OR_{18}$

and/or  $-\overset{\text{A}_1}{\underset{\text{H}}{\text{C}}}-N(R_{18})_2$  or  $Z_1$  is  $C_2$ - $C_{24}$ alkyl which is interrupted once or more than once by O, S

or  $NR_{14}$  and which can be substituted by  $OR_{15}$ ,  $SR_{15}$ ,  $N(R_{16})(R_{17})$ , phenyl, halogen,  $-\overset{\text{O}}{\underset{\text{H}}{\text{C}}}-\text{CH}_2$ ,

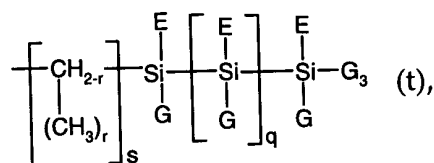
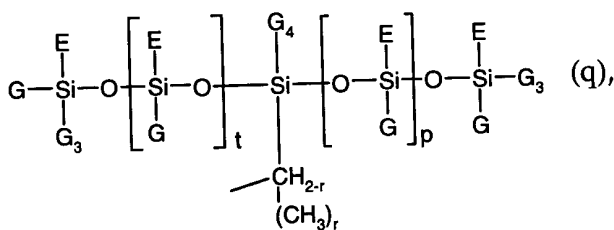
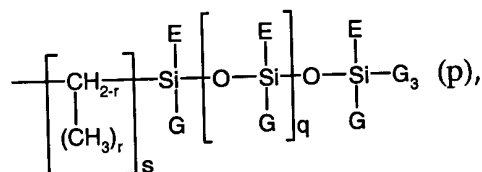
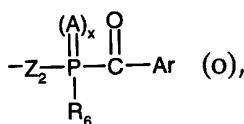
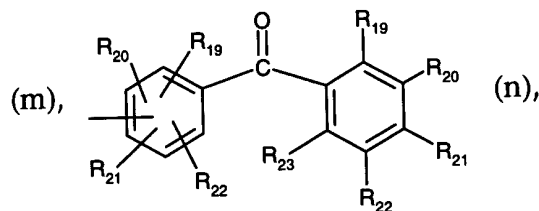
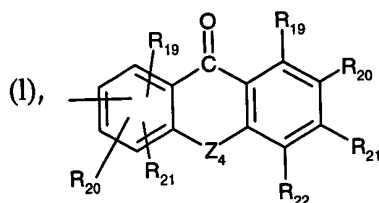
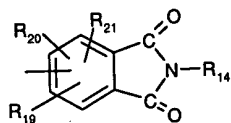
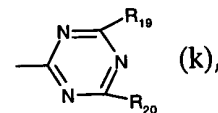
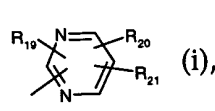
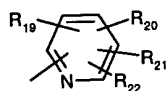
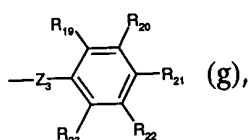
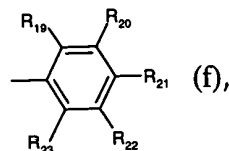
$-\overset{\overset{\text{A}}{\parallel}}{\text{C}}-\text{R}_{18}$ ,  $-\overset{\overset{\text{A}}{\parallel}}{\text{C}}-\text{OR}_{18}$  and/or  $-\overset{\overset{\text{A}}{\parallel}}{\text{C}}-\text{N}(\text{R}_{18})_2$ ; or  $\text{Z}_1$  is  $\text{C}_1\text{-C}_{24}$ alkoxy, which is substituted once

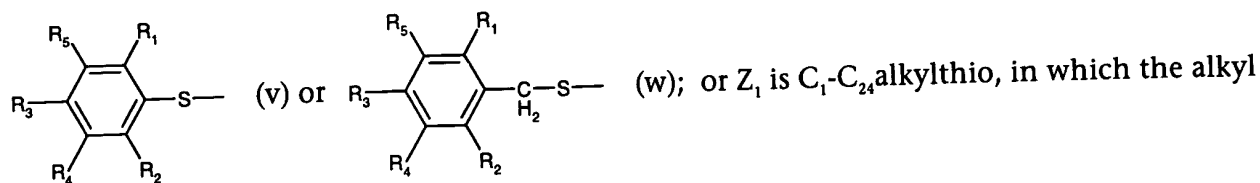
or more than once by phenyl, CN,  $-\text{N}=\text{C}=\text{A}$ ,  $-\overset{\overset{\text{O}}{\parallel}}{\text{C}}-\text{CH}_2$ ,  $-\overset{\overset{\text{A}}{\parallel}}{\text{C}}-\text{R}_{18}$ ,  $-\overset{\overset{\text{A}}{\parallel}}{\text{C}}-\text{OR}_{18}$  and/or

$-\overset{\overset{\text{A}}{\parallel}}{\text{C}}-\text{N}(\text{R}_{18})_2$ ; or  $\text{Z}_1$  is  $-\overset{\overset{\text{A}}{\parallel}}{\text{C}}-\text{OR}_{11}$ ,  $-\overset{\overset{\text{A}}{\parallel}}{\text{C}}-\text{N}(\text{R}_{16})(\text{R}_{17})$ ,  $-\overset{\overset{\text{A}}{\parallel}}{\text{C}}-\text{OR}_{11a}$  or  $-\overset{\overset{\text{A}}{\parallel}}{\text{C}}-\text{N}(\text{R}_{18a})(\text{R}_{18b})$ ; or

$\text{Z}_1$  is unsubstituted  $\text{C}_3\text{-C}_{24}$ cycloalkyl or  $\text{C}_3\text{-C}_{24}$ cycloalkyl substituted by  $\text{C}_1\text{-C}_{20}$ alkyl,  $\text{OR}_{11}$ ,  $\text{CF}_3$  or halogen; unsubstituted  $\text{C}_2\text{-C}_{24}$ alkenyl or  $\text{C}_2\text{-C}_{24}$ alkenyl substituted by  $\text{C}_6\text{-C}_{12}$ aryl, CN,  $(\text{CO})\text{OR}_{15}$  or

$(\text{CO})\text{N}(\text{R}_{18})_2$ ; or  $\text{Z}_1$  is  $\text{C}_3\text{-C}_{24}$ cycloalkenyl or is one of the radicals

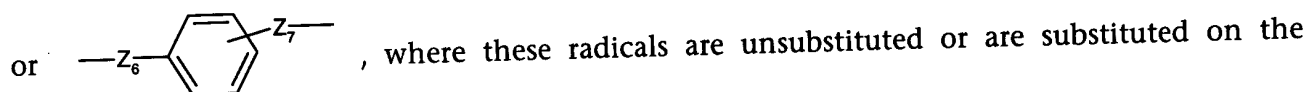
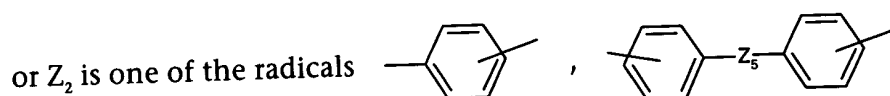




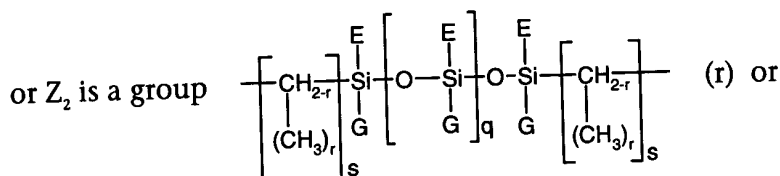
radical is uninterrupted or interrupted once or more than once by nonconsecutive O or S, and is unsubstituted or substituted by  $OR_{15}$ ,  $SR_{15}$  and/or halogen; with the proviso that  $Z_1$  and  $R_6$  are not identical;

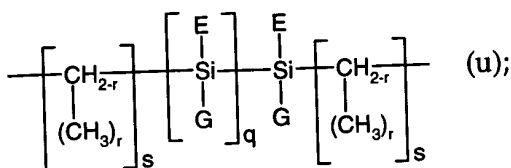
$A_1$  is O, S or  $NR_{18a}$ ;

$Z_2$  is  $C_1-C_{24}$ alkylene;  $C_2-C_{24}$ alkylene interrupted once or more than once by O, S or  $NR_{14}$ ;  $C_2-C_{24}$ alkenylene;  $C_2-C_{24}$ alkenylene interrupted once or more than once by O, S or  $NR_{14}$ ;  $C_3-C_{24}$ cycloalkylene;  $C_3-C_{24}$ cycloalkylene interrupted once or more than once by O, S or  $NR_{14}$ ;  $C_3-C_{24}$ cycloalkenylene;  $C_3-C_{24}$ cycloalkenylene interrupted once or more than once by O, S or  $NR_{14}$ ; where the radicals  $C_1-C_{24}$ alkylene,  $C_2-C_{24}$ alkylene,  $C_2-C_{24}$ alkenylene,  $C_3-C_{24}$ cycloalkylene and  $C_3-C_{24}$ cycloalkenylene are unsubstituted or are substituted by  $OR_{11}$ ,  $SR_{11}$ ,  $N(R_{12})(R_{13})$  and/or halogen;



aromatic by  $C_1-C_{20}$ alkyl;  $C_2-C_{20}$ alkyl which is interrupted once or more than once by nonconsecutive O atoms and which is unsubstituted or substituted by OH and/or SH;  $OR_{11}$ ,  $SR_{11}$ ,  $N(R_{12})(R_{13})$ , phenyl, halogen,  $NO_2$ , CN,  $(CO)-OR_{11}$ ,  $(CO)-R_{11}$ ,  $(CO)-N(R_{12})(R_{13})$ ,  $SO_2R_{24}$ ,  $OSO_2R_{24}$ ,  $CF_3$  and/or  $CCl_3$ ;





$Z_3$  is  $\text{CH}_2$ ,  $\text{CH}(\text{OH})$ ,  $\text{CH}(\text{CH}_3)$  or  $\text{C}(\text{CH}_3)_2$ ;

$Z_4$  is S, O,  $\text{CH}_2$ ,  $\text{C}=\text{O}$ ,  $\text{NR}_{14}$  or a direct bond;

$Z_5$  is S, O,  $\text{CH}_2$ ,  $\text{CHCH}_3$ ,  $\text{C}(\text{CH}_3)_2$ ,  $\text{C}(\text{CF}_3)_2$ , SO,  $\text{SO}_2$ , CO;

$Z_6$  and  $Z_7$  independently of one another are  $\text{CH}_2$ ,  $\text{CHCH}_3$  or  $\text{C}(\text{CH}_3)_2$ ;

$r$  is 0, 1 or 2;

$s$  is a number from 1 to 12;

$q$  is a number from 0 to 50;

$t$  and  $p$  are each a number from 0 to 20;

$E$ ,  $G$ ,  $G_3$  and  $G_4$  independently of one another are unsubstituted  $\text{C}_1$ - $\text{C}_{12}$ alkyl or  $\text{C}_1$ - $\text{C}_{12}$ alkyl substituted by halogen, or are unsubstituted phenyl or phenyl substituted by one or more  $\text{C}_1$ - $\text{C}_4$ alkyl; or are  $\text{C}_2$ - $\text{C}_{12}$ alkenyl;

$R_{11a}$  is  $\text{C}_1$ - $\text{C}_{20}$ alkyl substituted once or more than once by  $\text{OR}_{15}$  or  $-\overset{\text{O}}{\underset{\text{H}}{\text{C}}}-\text{CH}_2$ ; or is  $\text{C}_2$ - $\text{C}_{20}$ alkyl

which is interrupted once or more than once by nonconsecutive O atoms and is unsubstituted

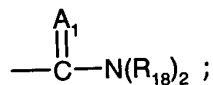
or substituted once or more than once by  $\text{OR}_{15}$ , halogen or  $-\overset{\text{O}}{\underset{\text{H}}{\text{C}}}-\text{CH}_2$ ; or  $R_{11a}$  is  $\text{C}_2$ - $\text{C}_{20}$ alkenyl,  $\text{C}_3$ -

$\text{C}_{12}$ alkynyl; or  $R_{11a}$  is  $\text{C}_3$ - $\text{C}_{12}$ cycloalkenyl which is substituted once or more than once by halogen,

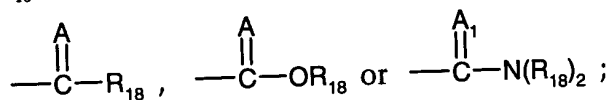
$\text{NO}_2$ ,  $\text{C}_1$ - $\text{C}_6$ alkyl,  $\text{OR}_{11}$  or  $\text{C}(\text{O})\text{OR}_{18}$ ; or  $\text{C}_7$ - $\text{C}_{16}$ arylalkyl or  $\text{C}_8$ - $\text{C}_{16}$ arylalkyl;

$R_{14}$  is hydrogen, phenyl,  $\text{C}_1$ - $\text{C}_{12}$ alkoxy,  $\text{C}_1$ - $\text{C}_{12}$ alkyl or  $\text{C}_2$ - $\text{C}_{12}$ alkyl which is interrupted once or more than once by O or S and which is unsubstituted or substituted by OH and/or SH;

$R_{15}$  has one of the meanings given for  $R_{11}$  or is a radical  $-\overset{\text{A}}{\underset{\text{H}}{\text{C}}}-\text{R}_{18}$ ,  $-\overset{\text{A}}{\underset{\text{H}}{\text{C}}}-\text{OR}_{18}$  or



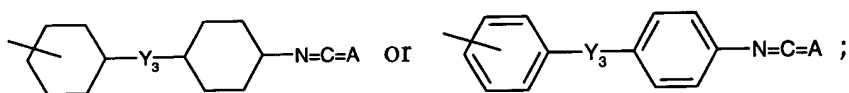
$R_{16}$  and  $R_{17}$  independently of one another have one of the meanings given for  $R_{12}$  or are a radical



$R_{18}$  is hydrogen,  $C_1$ - $C_{24}$ alkyl,  $C_2$ - $C_{12}$ alkenyl,  $C_3$ - $C_8$ cycloalkyl, phenyl, benzyl;  $C_2$ - $C_{20}$ alkyl which is interrupted once or more than once by O or S and which is unsubstituted or substituted by OH;  $R_{18a}$  and  $R_{18b}$  independently of one another are hydrogen;  $C_1$ - $C_{20}$ alkyl, which is substituted once or more than once by  $OR_{15}$ , halogen, styryl, methylstyryl,  $-N=C=A$  or  $-\overset{\text{O}}{\underset{\text{H}}{\text{C}}}-CH_2$ ; or  $C_2$ - $C_{20}$ alkyl, which is interrupted once or more than once by nonconsecutive O atoms and which is unsubstituted or substituted once or more than once by  $OR_{15}$ , halogen, styryl, methylstyryl or

$-\overset{\text{O}}{\underset{\text{H}}{\text{C}}}-CH_2$ ; or  $R_{18a}$  and  $R_{18b}$  are  $C_2$ - $C_{12}$ alkenyl;  $C_5$ - $C_{12}$ cycloalkyl, which is substituted by  $-N=C=A$  or

$CH_2-N=C=A$  and is additionally unsubstituted or substituted by one or more  $C_1$ - $C_4$ alkyl; or  $R_{18a}$  and  $R_{18b}$  are  $C_6$ - $C_{12}$ aryl, unsubstituted or substituted once or more than once by halogen,  $NO_2$ ,  $C_1$ - $C_6$ alkyl,  $C_2$ - $C_4$ alkenyl,  $OR_{11}$ ,  $-N=C=A$ ,  $-CH_2-N=C=A$  or  $C(O)OR_{18}$ ; or  $R_{18a}$  and  $R_{18b}$  are  $C_7$ - $C_{16}$ arylalkyl; or  $R_{18a}$  and  $R_{18b}$  together are  $C_8$ - $C_{16}$ arylcycloalkyl; or  $R_{18a}$  and  $R_{18b}$  independently of one another are



$Y_3$  is O, S, SO,  $SO_2$ ,  $CH_2$ ,  $C(CH_3)_2$ ,  $CHCH_3$ ,  $C(CF_3)_2$ , (CO), or a direct bond;

$R_{19}$ ,  $R_{20}$ ,  $R_{21}$ ,  $R_{22}$  and  $R_{23}$  independently of one another are hydrogen,  $C_1$ - $C_{20}$ alkyl;  $C_2$ - $C_{20}$ alkyl, which is interrupted once or more than once by nonconsecutive O atoms and which is unsubstituted or substituted by OH and/or SH; or  $R_{19}$ ,  $R_{20}$ ,  $R_{21}$ ,  $R_{22}$  and  $R_{23}$  are  $OR_{11}$ ,  $SR_{11}$ ,  $N(R_{12})(R_{13})$ ,  $NO_2$ , CN,  $SO_2R_{24}$ ,  $OSO_2R_{24}$ ,  $CF_3$ ,  $CCl_3$ , halogen; or phenyl which is unsubstituted or substituted once or more than once by  $C_1$ - $C_4$ alkyl or  $C_1$ - $C_4$ alkoxy;

or in each case two of the radicals  $R_{19}$ ,  $R_{20}$ ,  $R_{21}$ ,  $R_{22}$  and  $R_{23}$  together form  $C_1$ - $C_{20}$ alkylene which is uninterrupted or interrupted by O, S or  $-NR_{14}$ ;

$R_{24}$  is  $C_1$ - $C_{12}$ alkyl, halogen-substituted  $C_1$ - $C_{12}$ alkyl, phenyl, or phenyl substituted by  $OR_{11}$  and/or  $SR_{11}$ ;

with the proviso that  $R_6$  and  $Z_1$  are not identical,

as photoinitiator.